
Installation

Multi-Channel Data System (MCDS)

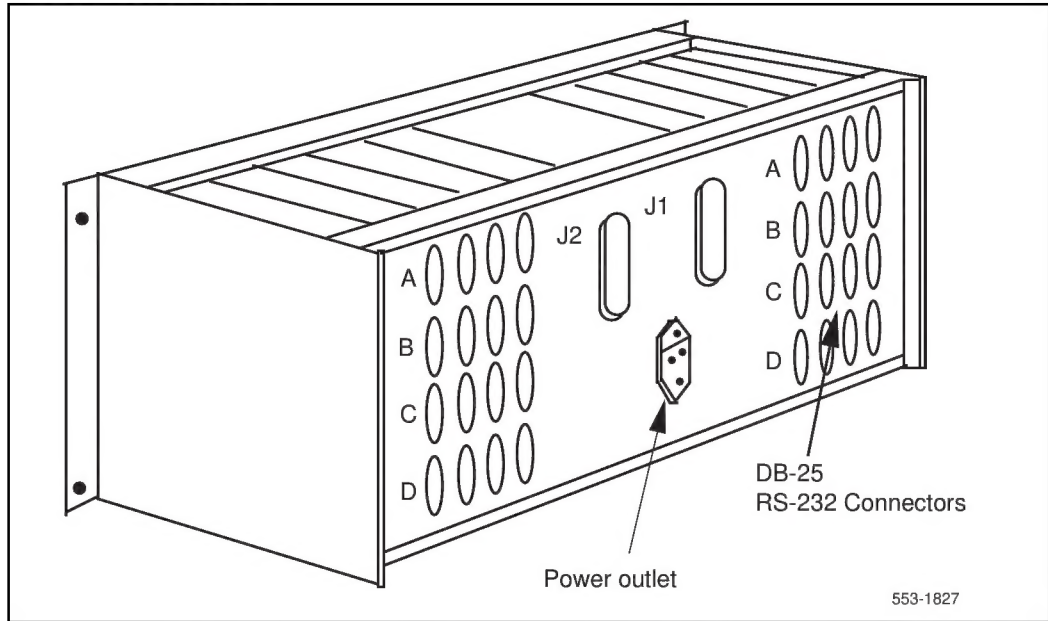
The MCDS is for use in computer rooms for interfacing multiple computer ports to the Meridian 1. The HSDC is mounted in the standard MCDS shelf (QSD27). Each shelf can accommodate up to eight HSDCs, eight Asynchronous Interface Line Cards (AILC QPC397), or any combination of the two, totaling eight. For each AILC, the MCDS shelf identifies four ports (units) A, B, C, and D. The HSDC supports two data ports per card. As a result, it uses only ports (units) A and C of the MCDS shelf.

The major equipment required to implement the MCDS is listed here:

— MCDS Shelf	QSD27
— MCDS Power Supply 110V	QSY27
— MCDS Power Supply 220V	QSY32
— 2-Port High Speed Data Card	QPC918
— 4-Port Line Card	QPC432
— 4-Port Asynch. Interface Card	QPC397
— MCDS Desk Cabinet (optional)	QCA77
— MCDS Rack Cabinet (optional)	QCA76

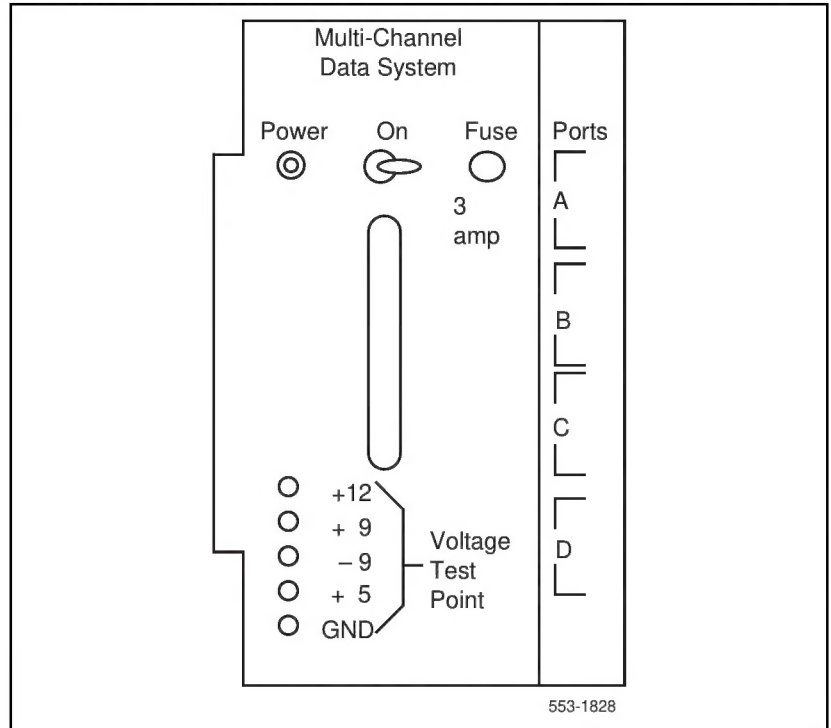
The MCDS shelf (Figure 3) houses a center-mounted power supply and four HSDCs or AILCs mounted on each side of the power supply (a total of eight). It can be either a stand-alone unit on an equipment frame or mounted in the MCDS cabinet. It is equipped with front flange mounting brackets and is 19 in. wide, 14 in. high, and 14.25 in. deep.

Figure 3
MCDS QSD27 shelf



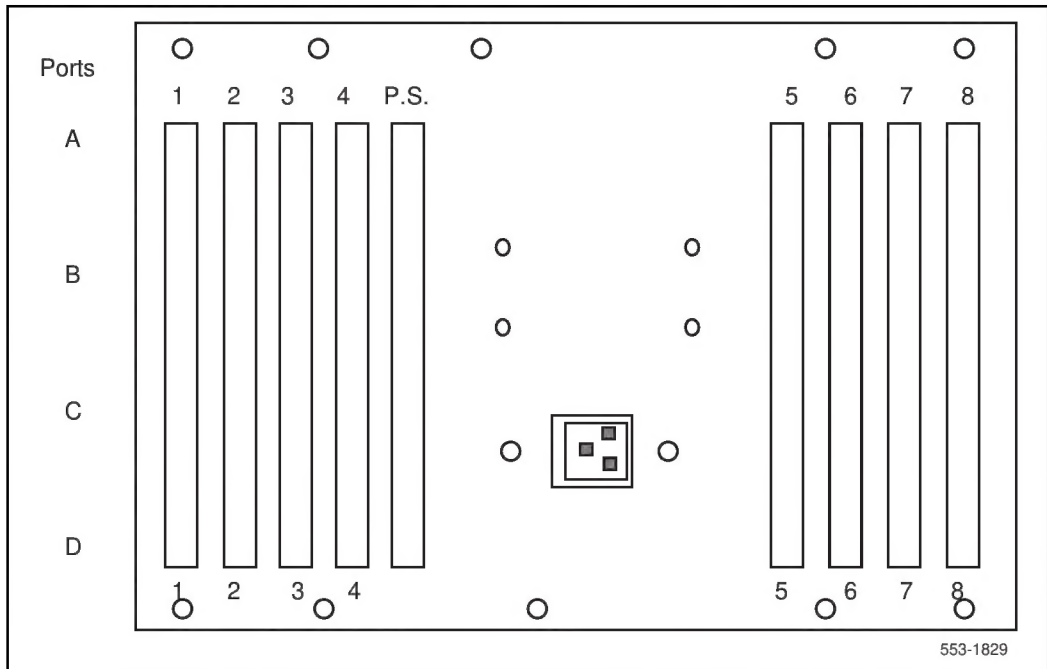
The MCDS power supply (Figure 4) is an off-line, switched mode supply that provides multiple, regulated, and protected DC voltage to the shelf backplane. It requires 1.7 A from a 110V, 60 Hz AC source. An optional MCDS power supply (QSY32) is available that connects to 220 V Hz AC lines.

Figure 4
MCDS power supply



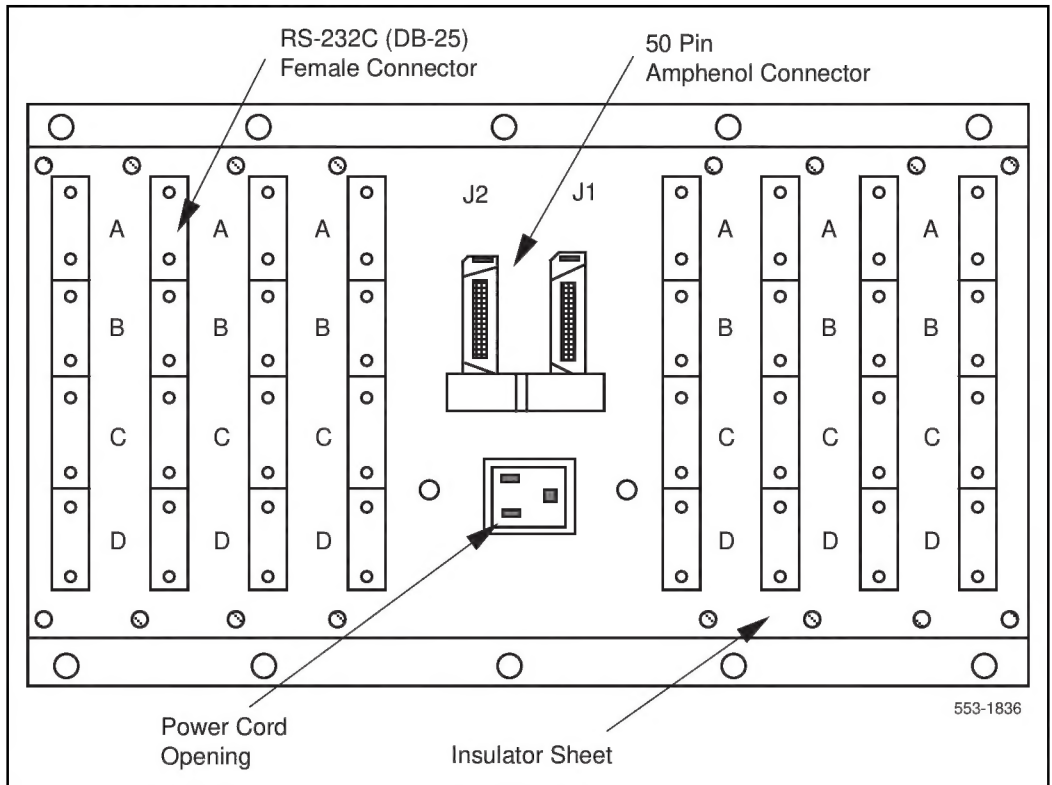
The MCDS backplane (Figures 5 and 6), that is a part of the shelf assembly, has two-sided circuitry. It is equipped with nine 160-pin connectors to receive the interface cards and shelf power supply. It is also equipped with two 25-pair standard Amphenol type plugs (J1, J2) to connect to the Meridian 1, and 32 female, standard RS-232-C (DB-25) connectors to provide interface to the computer ports (DTEs). The backplane is also provided with an insulator sheet on the rear surface to prevent accidental shorting of the traces with metal connector hoods.

Figure 5
MCDS backplane (front view)



The Spectron patch panel is inserted between the MCDS and the DTE computer ports to provide a convenient means of rearranging interconnections and for maintenance diagnostics. Each panel contains 16 plug-in modules. To monitor a 2-shelf MCDS cabinet, two panels are required.

Figure 6
MCDS backplane (rear view)



The AILC card supports four asynchronous DTEs that use 7-bit ASCII code and 1 or 2 stop bits. It supports full duplex (FDX) and half duplex (HDX) modes of operation and provides auto-answer capability only.

The QPC432 4PDLC supports two HSDCs or one AILC.

MCDS shelf to DTE connection

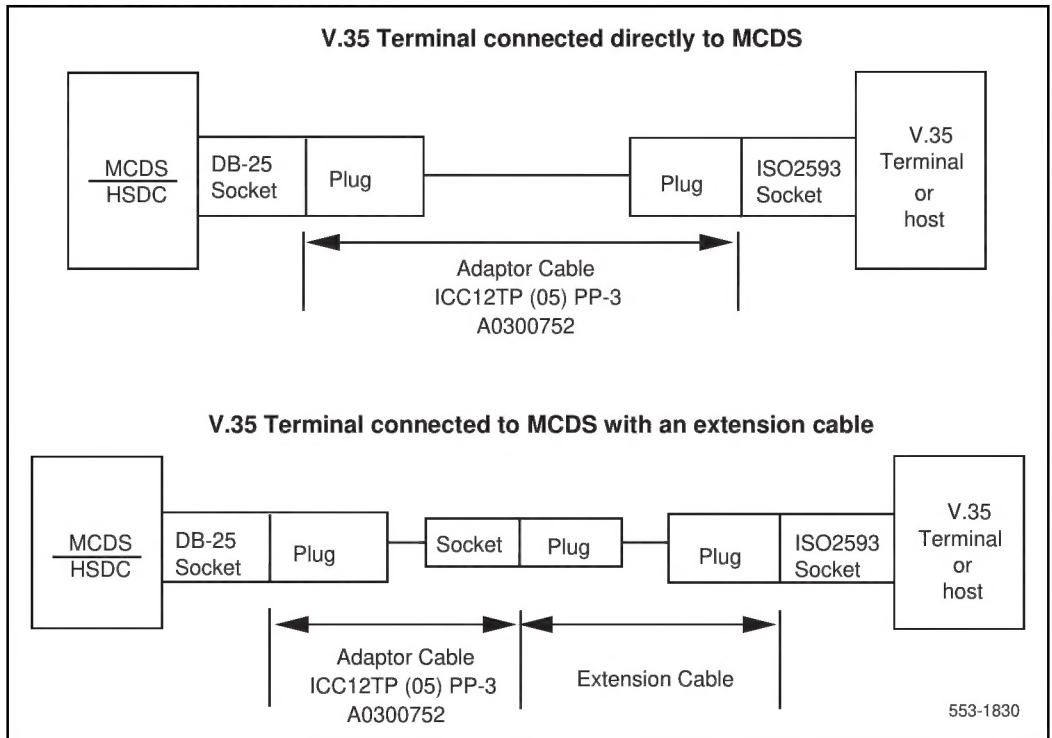
When the Spectron patch panel is not used, connect the MCDS shelf to the computer ports with an RS-232-C cable equipped with male-type 25-pin connectors.

When the Spectron patch panel is used, use a Spectron patch cable to connect the MCDS shelf to the assigned monitor jacks of the patch panel, which is labeled Modem. Then connect the associated equipment jacks (labeled Equip.) to the computer ports with an RS-232-C cable equipped with male-type 25-pin connectors.

When the HSDC is used as the V.35 interface unit, an adapter cable is needed to convert the ISO-2110 (DB-25) connector on the MCDS backplane into an ISO-2593 (34-pin rectangular) connector. Figure 7 shows the details and connection of the adapter cable.

For DTE equipped with a female ISO-2593, an adapter cable, number A0300752, is required. For DTE equipped with a male ISO-2593, an adapter cable, number A0300753, is required.

Figure 7
MCDS to V.35 DTE connection



MCDS shelf to Meridian 1 connection

The selection plugs J3 and J4 on the HSDC are provided to select a 22/24-gauge inside wire or 24/26-gauge outside wire.

Designation	Setting
E5, E7	inside 22/24 AWG
E6, E8	outside 24/26 AWG

The physical capacities and provisioning requirements of Meridian 1 Data feature hardware must be met upon installation. Table 6 lists cabling and environmental requirements and limitations. All hardware is installed using basic installation tools.

Table 6
MCDS to SL-1 cabling

Allowable Cabling	Type D PVC inside wiring cable; PIC for outside use only.		
Maximum separation distances (by cable type)			
MCDS to 4PDLC			
	PIC Outside	PVC Inside	Gauge
	4000 ft (1220 m)	4000 ft (1219 m)	22 AWG
	3500 ft (1070 m)	2900 ft (884 m)	24 AWG
	2000 ft (610 m)		26 AWG
	2500 ft (760 m)	2500 ft (760 m)	22/24 mixed
	1500 ft (460 m)	1200 ft (370 m)	24/26 mixed

The MCDS shelf cabling sequence is shown in Figure 8.

Note: Each HSDC uses only Port A (Unit A) and Port C (Unit C) of the MCDS shelf.

Figure 8
MCDS shelf to host

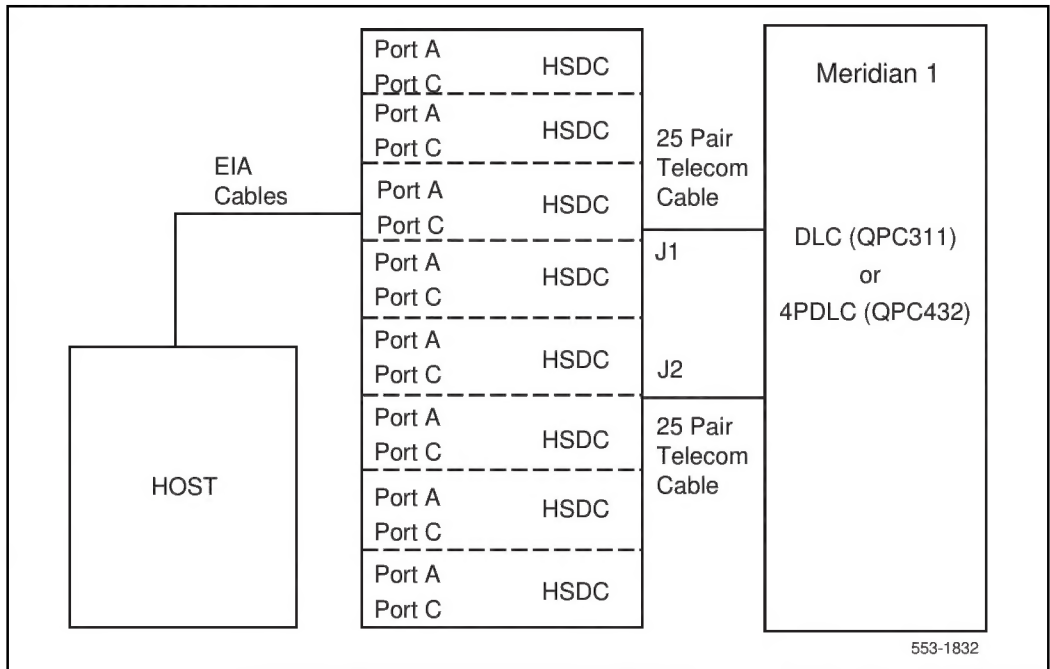


Table 7 lists the MCDS shelf pair-terminations and Tables 9 through 9 list the NT8D13 PE Module I/O Panel connectors and the signal assignments to the connector pins, and the QPC432 (4PDLC) and QPC311 DLC units and their I/O port signals.

Note: The HSDC uses only Ports A and C on the MCD.

Only units D1 and D3 of the QPC311 DLC and units 0 to 3 of the QPC432 4PDLC can be used.

The I/O Panel connectors for the NT8D13 PE module can also be used for QSD64, QSD65, QSD80, QSP35, and QSP36 PE shelves.

Figure 8 shows the connection of the MCDS shelf to the SL-1 and host computer.

Table 7
MCDS shelf pair-terminating sequence (Part 1 of 2)

Cable J1						Cable J2					
Pair	Pin	Pair Color	Card 1–4			Pair	Pin	Pair Color	Card 5–8		
1T R	26 1	W-BL BL-W	Card 1	Unit A		1T R	26 1	W-BL BL-W	Card 5	Unit A	
2T R	27 2	W-O O-W	Card 1	Unit B		2T R	27 2	W-O O-W	Card 5	Unit B	
3T R	28 3	W-G G-W	Card 1	Unit C		3T R	28 3	W-G G-W	Card 5	Unit C	
4T R	29 4	W-BR BR-W	Card 1	Unit D		4T R	29 4	W-BR BR-W	Card 5	Unit D	
5T R	30 5	W-S S-W	Card 2	Unit A		5T R	30 5	W-S S-W	Card 6	Unit A	
6T R	31 6	R-BL BL-R	Card 2	Unit B		6T R	31 6	R-BL BL-R	Card 6	Unit B	
7T R	32 7	R-O O-R	Card 2	Unit C		7T R	32 7	R-O O-R	Card 6	Unit C	
8T R	33 8	R-G G-R	Card 2	Unit D		8T R	33 8	R-G G-R	Card 6	Unit D	
9T R	34 9	R-BR BR-R	Card 3	Unit A		9T R	34 9	R-BR BR-R	Card 7	Unit A	
10T R	35 10	R-S S-R	Card 3	Unit B		10T R	35 10	R-S S-R	Card 7	Unit B	
11T R	36 11	BK-BL BL-BK	Card 3	Unit C		11T R	36 11	BK-BL BL-BK	Card 7	Unit C	
12T R	37 12	BK-O O-BK	Card 3	Unit D		12T R	37 12	BK-O O-BK	Card 7	Unit D	

Table 7
MCDS shelf pair-terminating sequence (Part 2 of 2)

Cable J1					
Pair	Pin	Pair Color	Card 1–4		
13T R	38 13	BK-G G-BK	Card 4	Unit A	
14T R	39 14	BK-BR BR-BK	Card 4	Unit B	
15T R	40 15	BK-S S-BK	Card 4	Unit C	
16T R	41 16	Y-BL BL-Y	Card 4	Unit D	
17T R	42 17	Y-O O-Y	Spare		
18T R	43 18	Y-G G-Y			
19T R	44 19	Y-BR BR-Y			
20T R	45 20	Y-S S-Y			
21T R	46 21	V-BL BL-V			
22T R	47 22	V-O O-V			
23T R	48 23	V-G G-V			
24T R	49 24	V-BR BR-V			
25T R	50 25	V-S S-V	Spare		

Cable J2					
Pair	Pin	Pair Color	Card 5–8		
13T R	38 13	BK-G G-BK	Card 8	Unit A	
14T R	39 14	BK-BR BR-BK	Card 8	Unit B	
15T R	40 15	BK-S S-BK	Card 8	Unit C	
16T R	41 16	Y-BL BL-Y	Card 8	Unit D	
17T R	42 17	Y-O O-Y	Spare		
18T R	43 18	Y-G G-Y			
19T R	44 19	Y-BR BR-Y			
20T R	45 20	Y-S S-Y			
21T R	46 21	V-BL BL-V			
22T R	47 22	V-O O-V			
23T R	48 23	V-G G-V			
24T R	49 24	V-BR BR-V			
25T R	50 25	V-S S-V	Spare		

Table 8
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors A, C, E, and G (Single Loop Mode)
(Part 1 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors				4PDLC		DLC	
			A	C	E	G	Sig	Unit	Sig	Unit
1T 1R 2T 2R	26 1 27 2	W-BL BL-W W-O O-W	S L O T X-1	S L O T X-4	S L O T X-7	S L O T X-10	T R SA SB	D0	T R SA SB	V0
3T 3R 4T 4R	28 3 29 4	W-G G-W R-BL BL-R					T R SA SB	D1	T R SA SB	D1
5T 5R 6T 6R	30 5 31 6	W-S S-W R-BL BL-R					T R SA SB	D2	T R SA SB	V2
7T 7R 8T 8R	32 7 33 8	R-O O-R R-G G-R					T R SA SB	D3	T R SA SB	D3
9T 9R 10T 10R	34 9 35 10	R-BR BR-R R-S S-R								
11T 11R 12T 12R	36 11 37 12	BK-BL BL-BK BL-O O-BL								
13T 13R 14T 14R	38 13 39 14	BK-G G-BK BK-BR BR-BK								
15T 15R 16T 16R	40 15 41 16	BK-S S-BK Y-BL BL-Y								

Table 8
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors A, C, E, and G (Single Loop Mode)
(Part 2 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors				4PDLC		DLC	
			A	C	E	G	Sig	Unit	Sig	Unit
17T 17R 18T 18R	42 17 43 18	Y-O O-Y Y-G G-Y	S L O T X-2	S L O T X-5	S L O T X-8	S P A R E	T R SA SB	D0	T R SA SB	V0
19T 19R 20T 20R	44 19 45 20	Y-BR BR-Y Y-S S-Y					T R SA SB	D1	T R SA SB	D1
21T 21R 22T 22R	46 21 47 22	V-BL BL-V V-O O-V					T R SA SB	D2	T R SA SB	V2
23T 23R 24T 24R	48 23 49 24	V-BR BR-V V-S S-V					T R SA SB	D3	T R SA SB	D3

Table 9
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors B, D, and F (Single Loop Mode)
(Part 1 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors			4PDLC		DLC	
			B	D	F	Sig	Unit	Sig	Unit
1T 1R 2T 2R	26 1 27 2	W-BL BL-W W-O O-W	S L O T X-2	S L O T X-5	S L O T X-8				
3T 3R 4T 4R	28 3 29 4	W-S S-W R-BL BL-R							
5T 5R 6T 6R	30 5 31 6	W-S S-W R-BL BL-R							
7T 7R 8T 8R	32 7 33 8	R-O O-R R-G G-R							

Table 9
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors B, D, and F (Single Loop Mode)
(Part 2 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors			4PDLC		DLC	
			B	D	F	Sig	Unit	Sig	Unit
9T 9R 10T 10R	34 9 35 10	R-BR BR-R R-S S-R	S L O T X-3 C A R D 3	S L O T X-6 C A R D 6	S L O T X-9 C A R D 9	T R SA SB	D0	T R SA SB	V0
11T 11R 12T 12R	36 11 37 12	BK-BL BL-BK BL-O O-BL				T R SA SB	D1	T R SA SB	D1
13T 13R 14T 14R	38 13 39 14	BK-G G-BK BK-BR BR-BK				T R SA SB	D2	T R SA SB	V2
15T 15R 16T 16R	40 15 41 16	BK-S S-BK Y-BL BL-Y				T R SA SB	D3	T R SA SB	D3
17T 17R 18T 18R	42 17 43 18	Y-O O-Y Y-G G-Y							
19T 19R 20T 20R	44 19 45 20	Y-BR BR-Y Y-S S-Y							
21T 21R 22T 22R	46 21 47 22	V-BL BL-V V-O O-V							
23T 23R 24T 24R	48 23 49 24	V-BR BR-V V-S S-V							

Table 10
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors A, C, E, and G (Single Loop Mode)
(Part 1 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors				4PDLC		DLC	
			A	C	E	G	Sig	Unit	Sig	Unit
1T 1R 2T 2R	26 1 27 2	W-BL BL-W W-O O-W	S L O T X-1	S L O T X-4	S L O T Y-2	S L O T Y-5	T R SA SB	D0	T R SA SB	V0
3T 3R 4T 4R	28 3 29 4	W-S S-W R-BL BL-R					T R SA SB	D1	T R SA SB	D1
5T 5R 6T 6R	30 5 31 6	W-S S-W R-BL BL-R					T R SA SB	D2	T R SA SB	V2
7T 7R 8T 8R	32 7 33 8	R-O O-R R-G G-R					T R SA SB	D3	T R SA SB	D3
9T 9R 10T 10R	34 9 35 10	R-BR BR-R R-S S-R								
11T 11R 12T 12R	36 11 37 12	BK-BL BL-BK BL-O O-BL								
13T 13R 14T 14R	38 13 39 14	BK-G G-BK BK-BR BR-BK								
15T 15R 16T 16R	40 15 41 16	BK-S S-BK Y-BL BL-Y								

Table 10
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors A, C, E, and G (Single Loop Mode)
(Part 2 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors				4PDLC		DLC	
			A	C	E	G	Sig	Unit	Sig	Unit
17T 17R 18T 18R	42 17 43 18	Y-O O-Y Y-G G-Y	S L O T X-2	S L O T X-5	S L O T Y-8	S P A R E	T R SA SB	D0	T R SA SB	V0
19T 19R 20T 20R	44 19 45 20	Y-BR BR-Y Y-S S-Y					T R SA SB	D1	T R SA SB	D1
21T 21R 22T 22R	46 21 47 22	V-BL BL-V V-O O-V					T R SA SB	D2	T R SA SB	V2
23T 23R 24T 24R	48 23 49 24	V-BR BR-V V-S S-V					T R SA SB	D3	T R SA SB	D3

Table 11
QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors B, D, and F (Single Loop Mode)
(Part 1 of 2)

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors			4PDLC		DLC	
			B	D	F	Sig	Unit	Sig	Unit
1T 1R 2T 2R	26 1 27 2	W-BL BL-W W-O O-W	S L O T X-2 C A R D 2	S L O T X-5 C A R D 5	S L O T Y-3 C A R D 3				
3T 3R 4T 4R	28 3 29 4	W-S S-W R-BL BL-R							
5T 5R 6T 6R	30 5 31 6	W-S S-W R-BL BL-R							
7T 7R 8T 8R	32 7 33 8	R-O O-R R-G G-R							

Table 11

**QPC432 (4PDLC) and QPC311 DLC pair-terminations for NT8D13 PE
Module I/O Panel connectors B, D, and F (Single Loop Mode)
(Part 2 of 2)**

Port Pairs	Connector Pin Number and Wire Color Code		I/O Panel Connectors			4PDLC		DLC	
			B	D	F	Sig	Unit	Sig	Unit
9T 9R 10T 10R	34 9 35 10	R-BR BR-R R-S S-R	S L O T X-3 C A R D 3	S L O T Y-1 C A R D 1	S L O T Y-4 C A R D 4	T R SA SB	D0	T R SA SB	V0
11T 11R 12T 12R	36 11 37 12	BK-BL BL-BK BL-O O-BL				T R SA SB	D1	T R SA SB	D1
13T 13R 14T 14R	38 13 39 14	BK-G G-BK BK-BR BR-BK				T R SA SB	D2	T R SA SB	V2
15T 15R 16T 16R	40 15 41 16	BK-S S-BK Y-BL BL-Y				T R SA SB	D3	T R SA SB	D3
17T 17R 18T 18R	42 17 43 18	Y-O O-Y Y-G G-Y							
19T 19R 20T 20R	44 19 45 20	Y-BR BR-Y Y-S S-Y							
21T 21R 22T 22R	46 21 47 22	V-BL BL-V V-O O-V							
23T 23R 24T 24R	48 23 49 24	V-BR BR-V V-S S-V							

Service change

The Meridian 1 recognizes the HSDC port as an SL-1 telephone; the DLC and 4PDLC as SL-1 line cards. Use the LD77 to enter the HSDC port call processing into the system.

Define the following items:

- Key 0 Directory Number (DN)
- Key 1 Secondary Directory Number (DN)
- Key 2 Call Transfer (optional)
- Key 3 Autodial Calling (optional)
- Key 4 Ring Again (optional)
- Key 6 Speed Call (optional)
- Key 7 Display (DSP) (optional)
- Key 9 Release

Note 1: Key 2 is required to provide access to a manual outbound modem pooling.

Note 2: Key 3 is required to operate Autodial or the Hot Line feature.

Note 3: DSP requires the Class of Service updated to Digit Display (DDS) or Automatic Digit Display (ADD).

To use the 64 kbps data capability, the following Meridian 1 configurations are required:

- Meridian 1 software must be X11 release 12 or later.
- QPC720 PRI must be configured for B8ZS line coding.
- TI facility must support B8ZS line coding.
- For connection to SL-100, the software should be X11 release 13 or later; QPC720 PRI vintage B or higher should be configured for B8ZS.

Troubleshooting

If the HSDC does not operate properly, perform the following checks:

Procedure 1

HSDC troubleshooting procedures (general check)

- 1 Ensure that the MCDS power supply is powered on.
- 2 Operate the **fdtr** key on the HSDC faceplate and verify that the DTR lamp lights. Replace the HSDC if the lamp does not light.
- 3 The V.35 lamp should be ON if the 10-pin jumper plug is inserted into the V.35 socket on the HSDC. If the jumper is installed and the V.35 LED is off, replace the card.
- 4 Ensure that the data terminal power is ON and that the ON-LINE/OFF-LINE (LINE/LOCAL) switch (if equipped) is set to ON-LINE (LINE).
- 5 Ensure that the Data Terminal or Host Port is ready for data transmission with the proper speed and other parameters set appropriately.

If the call is connected but the station is not sending or receiving data, check the following:

- 6 Is the MONITOR SEND lamp on the DTE (if equipped) or the SD lamp on the HSDC flashing while sending data?

If the lamps do not flash:

- 7 Ensure the interface cable is properly connected to the MCDS and the DTE.
- 8 Ensure the ON-LINE/OFF-LINE (LINE/LOCAL) switch is set to ON-LINE (LINE).
- 9 If problems occur during call setup, disconnect and attempt to place the call again. Place the call from a regular phone to ensure that the far end data equipment and the HSDM or HSDC is properly set up and working before calling for service.

If the problem continues, place a test call using an Asynchronous Terminal connected to the HSDC port in loopback mode. The data sent by your terminal will be looped back. Perform the following steps:

Procedure 2
HSDC troubleshooting

- 1** Set the local HSDC to asynchronous, loopback, full duplex, and terminal mode. Make sure the remote HSDC or HSDM is set to the asynchronous mode and loopback is OFF.
- 2** Be sure that the terminal is set so it does not check parity or that it is set to 8 bits (no parity). If it is set to 7 bits, even, or odd parity, enter a period (.) and carriage-return (<CR>) to force the HSDC to calculate parity and provide legible prompts.
- 3** Press <CR> on the asynchronous terminal connected to the HSDC that is in loopback mode.
- 4** Dial the call using the terminal keyboard. The lamps for CONN and DTR should be ON for a successful call.
- 5** Check that the characters you type are echoed on the screen at the local terminal. If the characters are returned properly, check the remote DTE connected to the HSDC, HSDM, or both.
- 6** If the characters are not returned properly, place a call to another remote HSDC, HSDM, or both. If the problem persists, do the following:
 - Use LD32 to check that the QPC311 or QPC432 is enabled.
 - Enable the HSDC and proceed with troubleshooting.
 - Replace the HSDC.

Meridian 1

Transparent Data Networking

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